**Stephen B. Bram**
Vice President

Consolidated Edison Company of New York, Inc.
Indian Point Station
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Buchanan, NY 10511
Telephone (914) 734-5340

February 11, 1994

Re: Indian Point Unit No. 2
Docket No. 50-247

Document Control Desk
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

SUBJECT: Response to Request for Additional Information Regarding Generic Letter 92-08, "Thermo-Lag 330-1 Fire Barriers", Pursuant to 10 CFR 50.54(f) (TAC No. M85560)

The Attachment to this letter contains our response to the subject generic letter, and is provided pursuant to Section 182a, Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

Should you have any questions regarding this matter, please contact Mr. Charles W. Jackson, Manager, Nuclear Safety and Licensing.

Very truly yours,

Thomas Schneider

Subscribed and sworn to
before me this 11th day
of February, 1994.

Karen L. Lancaster
Notary
KAREN L. LANCASTER
Notary Public, State of New York
No. 60-4643659
Qualified In Westchester County
Term Expires 9/30/95

Attachment



A029
1/1

cc: Mr. Thomas T. Martin
Regional Administrator - Region I
US Nuclear Regulatory Commission
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Mr. Francis J. Williams, Jr., Project Manager
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ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING GENERIC LETTER 92-08

"Thermo-Lag 330-1 Fire Barriers"

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
INDIAN POINT UNIT NO. 2
DOCKET NO. 50-247
FEBRUARY, 1994

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**
**REGARDING GENERIC LETTER 92-08**

I. Thermo-Lag Fire Barrier Configurations and Amounts

B. Required Information

1. Describe the Thermo-Lag 330-1 barriers installed in the plant to

   a. meet 10 CFR 50.48 or Appendix R to 10 CFR Part 50,
   b. support an exemption from Appendix R,
   c. achieve physical independence of electrical systems,
   d. meet a condition of the plant operating license,
   e. satisfy licensing commitments.

   The descriptions should include the following information: the intended purpose and fire rating of the barrier (for example, 3-hour fire barrier, 1-hour fire barrier, radiant energy heat shield) and the type and dimension of the barrier (for example, 8-ft by 10-ft wall, 4-ft by 3-ft by 2-ft equipment enclosure, 36-inch-wide cable tray, or 3-inch-diameter conduit).

2. For the total population of Thermo-Lag fire barriers described under Item I.B.1, submit an approximation of:

   a. For cable tray barriers: the total linear feet and square feet of 1-hour barriers and the total linear feet and square feet of 3-hour barriers.

   b. For conduit barriers: the total linear feet of 1-hour barriers and the total linear feet of 3-hour barriers.

   c. For all other fire barriers: the total square feet of 1-hour barriers and the total square feet of 3-hour barriers.

   d. For all other barriers and radiant energy heat shields: the total linear or square feet of 1-hour barriers and the total linear or square feet of 3-hour barriers, as appropriate for the barrier configuration or type.

Response to I.B

Con Edison's April 16, 1993 response to Generic Letter 92-08 identified one area of Indian Point Unit No. 2 which currently has Thermo-Lag fire barrier material installed to protect components required for safe shutdown capability. To comply with the requirements of 10 CFR 50.48 and Appendix R to 10 CFR Part 50, a 3-hour fire barrier enclosure was constructed in 1985 around containment penetration H20 to protect the cables for the Alternate Safe Shutdown System (ASSS) instruments that monitor source range indication and reactor coolant system hot leg and cold leg temperatures. This enclosure separates the ASSS instruments from redundant instruments in the electrical penetration area and

protects the ASSS instruments in the event of a postulated fire in the electrical penetration area. The enclosure constitutes fire zone 74B in fire area Q, and the electrical penetration area is fire zone 74A in fire area A.

The configuration is a box enclosure approximately 1-ft-10-in-square by 4-ft-5-in-long. It consists of a seismically secured, welded structural steel frame, mounted on the concrete containment exterior wall, to which Thermo-Lag 3-hour pre-formed panels are retained with fasteners. Exposed cables not required for the ASSS exit the side of the enclosure through a 3-hour seal composed of 12 inches of Dow Corning 3-6548 RTV silicone foam formed in a 8-in-square by 12-in-long sheet metal sleeve that is covered with Thermo-Lag 3-hour pre-formed panels. The total area of the 3-hour panels is approximately 38 square feet. Cables for the ASSS instruments exit the enclosure in a 3-in-diameter conduit at the top that is protected with approximately 9 linear feet of 3-hour Thermo-Lag pre-formed conduit shapes. The conduit exits the electrical penetration area through the concrete ceiling and the penetration is capped with flashing and sealed with Dow Corning silicone elastomer. To prevent thermal shorts, all penetrations (supports, tubing, etc.) constituting a continuous path into the fire barrier are protected with 18 inches or more of Thermo-Lag 3-hour pre-formed conduit shapes, pre-formed panels and/or trowel grade material. All cables in the enclosure are instrumentation cables for which ampacity derating is not a concern.

II. Important Barrier Parameters

B. Required Information

1. State whether or not you have obtained and verified each of the aforementioned parameters for each Thermo-Lag barrier installed in the plant. If not, discuss the parameters you have not obtained or verified. Retain detailed information on site for NRC audit where the aforementioned parameters are known.

2. For any parameter that is not known or has not been verified, describe how you will evaluate the in-plant barrier for acceptability.

3. To evaluate NUMARC's application guidance, an understanding of the types and extent of the unknown parameters is needed. Describe the type and extent of the unknown parameters at your plant in this context.

Response to II.B

The 24 parameters of importance (listed in the letter) for utility use of data from the industry Thermo-Lag fire barrier test program were evaluated in the design and installation of our single Thermo-Lag configuration. The enclosure was designed utilizing these parameters, drawings were prepared and issued for construction, and the barrier was constructed by an installer who was trained and certified by the manufacturer. Con Edison Engineering, Construction and Quality Assurance/Control personnel surveilled the installation, evaluated and documented field changes, and the drawings were subsequently revised to indicate as-constructed conditions. Therefore, the parameters of the installed configuration are known as documented and verified in the original design and installation process. The information is retained in Con Edison Engineering files and in work package records stored offsite, and on plant drawings obtainable onsite.

It should be noted that the 24 parameter listing is still preliminary and will not be finalized until the NUMARC Application Guide is issued (with NRC agreement and approval). Any additional parameter verification effort at this time may prove to be unnecessary or incomplete based on the final content of the Application Guide.

In regard to the eight parameters (listed in the letter) of importance concerning cable protected by fire barriers, if fire tests demonstrate temperature criteria exceedances, one optional approach to resolution, as provided in the NRC draft test and acceptance criteria, would be to evaluate cable functionality at the elevated temperatures. In this case, determination of cable performance at elevated temperature (item 8) would be necessary, using cable performance test data or information for specific installed cable types (items 1, 2, 3 and 7). However, NRC

has yet to finalize requirements for cable functionality evaluation, nor are test results yet available that would clearly indicate the scope of such evaluations. The degree and conservatism of cable functionality evaluation requirements implied by the listing of cable parameters, and discussed in proposed Supplement 1 to Generic Letter 86-10, significantly exceeds the original requirements of Generic Letter 86-10.

Items 4, 5 and 6 of the listing of the eight parameters of importance address issues relative to potential cable/barrier contact for cable trays. This is an unresolved issue at this time. In our particular configuration, cables not required for the ASSS are in contact with the bottom panels of the enclosure and any damage to them is not a concern. This additional thermal mass could actually improve barrier system performance. NUMARC has agreed to provide additional thermocouples below the cable tray rungs in the Phase 2 cable tray tests to provide information to address NRC concerns relative to potential contact of cables with the cold side of the fire barriers. Further, note that a small piece of Sealtemp cloth (item 6) was used only in NUMARC test number 1-4 (24-inch-wide steel cable tray with air drop, 3-hour test), and did not impact performance or usability of the test.

III. Thermo-Lag Fire Barriers Outside the Scope of the NUMARC Program

B. Required Information

1. Describe the barriers discussed under Item I.B.1 that you have determined will not be bounded by the NUMARC test program.

2. Describe the plant-specific corrective action program or plan you expect to use to evaluate the fire barrier configurations particular to the plant. This description should include a discussion of the evaluations and tests being considered to resolve the fire barrier issues identified in GL 92-08 and to demonstrate the adequacy of existing in-plant barriers.

3. If a plant-specific fire endurance test program is anticipated, describe the following:

   a. Anticipated test specimens.

   b. Test methodology and acceptance criteria including cable functionality.

Response to III.B

The current NUMARC Phase 2 test program does not include a box enclosure that is specifically comparable to our installed configuration. However, the program does include 3-in-diameter conduit, conduit in box enclosures and 24-in-wide cable trays. It is our intent to incorporate the results of several of the tests to develop, for purposes of analysis, a composite tested configuration that is representative of our installed configuration. This composite configuration will be "engineered" per applicable guidance documents and the fundamental fire protection principles. Specifically, no attribute from a tested configuration that is less conservative than the configuration being qualified will be used as a parameter in a composite configuration. The assumptions used to qualify the installed configuration with a composite configuration will be described in a written justification. The justification is intended to document the qualification bases for the installed configuration which is not bound by the parameters of a particular tested configuration but is nonetheless considered a qualified fire barrier.

If all NUMARC test program results required to develop a qualified composite tested configuration are not successful, an engineering evaluation of the installed configuration will be required to analyze the adequacy of the fire barrier based on Generic Letter 86-10 criteria. The factors to include in this type of evaluation are a comparison and analysis of the installed configuration with tested configurations, general fire barrier integrity (materials, thickness, etc.), fire detection and suppression capabilities in the area, as well

as fire loading. The results of the evaluation will determine the barrier's ability to withstand the hazards in the area.
In summary, evaluation of our single installed configuration is directly dependent on the results of the NUMARC test program as currently defined, and the final NRC test/acceptance criteria. If an expanded generic test program or plant-specific test programs conducted by other utilities are undertaken, we will submit a supplemental response if the results of those efforts will be required to support evaluation of our box enclosure. At this time, Con Edison does not plan to conduct plant-specific testing of our single installed configuration.

IV. Alternatives

B. Required Information

Describe the specific alternatives available to you for achieving compliance with NRC fire protection requirements in plant areas that contain Thermo-Lag fire barriers. Examples of possible alternatives to Thermo-Lag-based upgrades include the following:

1. Upgrade existing in-plant barriers using other materials.

2. Replace Thermo-Lag barriers with other fire barrier materials or systems.

3. Reroute cables or relocate other protected components.

4. Qualify 3-hour barriers as 1-hour barriers and install detection and suppression systems to satisfy NRC fire protection requirements.

Response to IV.B

Factors that must be considered in determining which alternatives are most appropriate are the test/acceptance criteria (which have not been finalized and issued by NRC), results of Phase 2 testing (baseline and upgraded configurations), and comparison parameters and bounding conditions to be included in the NUMARC Application Guideline (scheduled to be finalized in mid-April). These factors will directly impact the generic applicability of a given test to our single installed configuration.

Alternatives 1, 2 and 4 are viable options for our particular configuration. Other potential alternatives include:

1. Re-evaluation of engineering analyses used for determination of Appendix R safe shutdown pathways, equipment, and actions could provide a basis for reduction in the scope of protected circuits and their associated fire barriers.

2. Exemption requests could be submitted based upon the use of fire modeling in conjunction with baseline (non-upgraded) test results to demonstrate adequate protection for the installed hazard. Alternatively or in conjunction, probabilistic safety analysis could be used as an exemption basis, by demonstrating insignificant core damage frequency impacts, assuming barrier inoperability.

A resolution may also be found by utilizing a combination of the above alternatives.

V. Schedules

B. Required Information

Submit an integrated schedule that addresses the overall corrective action schedule for the plant. At a minimum, the schedule should address the following aspects for the plant:

1. implementation and completion of corrective actions and fire barrier upgrades for fire barrier configurations within the scope of the NUMARC program,

2. implementation and completion of plant-specific analyses, testing, or alternative actions for fire barriers outside the scope of the NUMARC program.

Response to V

Due to the uncertainties noted in section IV of this response, we respectfully reserve the right to revise the proposed schedule below based on the outcome of the factors discussed in section IV and the completion of expanded generic testing, if implemented and if required to support evaluation of our configuration. The following preliminary schedule is proposed:

| | |
|---|---|
| May 31, 1994 | Review results of Phase 2 test program and Application Guide |
| December 31, 1994 | Specify plan of action |
| December 31, 1995 | Issue modification |
| February, 1997 | Start construction, complete by end of refueling outage (estimated start date) |

At this time the scope of work is undefined. Therefore, this schedule is conservatively based on the need to modify the configuration during an outage to preclude operational concerns caused by potential damage to other cabling in the area during performance of the work. The schedule could be accelerated if it is determined that required modification(s) can be completed during plant operation.

VI. Sources and Correctness of Information

Describe the sources of the information provided in response to this request for information (for example, from plant drawings, quality assurance documentation, walk downs or inspections) and how the accuracy and validity of the information was verified.

Response to VI

The information provided in this response was obtained from plant as-constructed drawings and Con Edison Engineering project files and personnel. The information is believed to be accurate and valid for the single installed configuration as documented in and based on the design control process, the work control process, the quality assurance/control coverage of the installation, the use of a Con Edison-approved manufacturer installation procedure manual, and the qualifications of the certified installer.